



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/736,020	12/15/2003	Guo Liu	SMBZ 2 01016 6865-312	4169

7590 06/12/2007  
James W. McKee  
Fay, Sharpe, Fagan  
Minnich & McKee, LLP, 7th Floor  
1100 Superior Avenue  
Cleveland, OH 44114-2518

EXAMINER
----------

THOMPSON, CAMIE S

ART UNIT	PAPER NUMBER
----------	--------------

1774

MAIL DATE	DELIVERY MODE
-----------	---------------

06/12/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/736,020	Applicant(s) LIU, GUO	
	Examiner Camie S. Thompson	Art Unit 1774	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on AfterFinal Amendment filed May 22, 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 and 17-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 23-32 is/are allowed.
- 6) ☒ Claim(s) 1,2,4-7,9,12,13,20 and 22 is/are rejected.
- 7) ☒ Claim(s) 3, 8, 10-11, 17-19 and 21 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. Examiner regrets the untimely reopening of prosecution.
2. Applicant's amendment and accompanying remarks filed May 22, 2007 are acknowledged.
3. The rejection of claims 17-19 and 32 under 35 U.S.C. 112, second paragraph is withdrawn due to applicant's argument.

### *Claim Rejections - 35 USC § 102*

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-2, 4-7, 9, 12-13, 20 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Velthaus et al., U.S. Patent Number 5,505,986.

Velthaus discloses a phosphor layer with the formula  $M'M''_2X_4:RE$  where  $M'$  is magnesium, calcium, strontium or barium;  $M''$  is sulfur or selenium and RE is a rare earth activator (see abstract and column 1, line 60-column 2, line 8). It is disclosed in column 2, lines 38-60 that a suitable insulating dielectric layer is deposited on the top and bottom of the phosphor layer.

Additionally, Velthaus discloses that insulators such as AlN can be used as barriers layers.

Velthaus also discloses that the rare earth activator can be europium or cerium (see column 2,

Art Unit: 1774

line 68). Column 3, lines 33-42 of the reference discloses that the multi-source reactive deposition can be multisource sputtering or chemical vapour deposition.

6. Claims 3, 8, 10-11, 17-19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art does not provide for the recited improved phosphor, further including a phosphor that has oxygen at a relative atomic concentration that is less than 0.2 of the combined S and Se concentrations. Additionally, the prior art does not provide for the recited improved phosphor wherein the phosphor is a zinc sulfo-selenide with an activating element and the aluminum nitride barrier layer has a thickness of about 20 nm to about 50 nm.

Claims 23-32 are allowed. The prior art does not provide for a thick film dielectric electroluminescent device constructed on a glass or glass ceramic substrate and comprising a phosphor selected from the group consisting of

- a) a rare earth activated barium thioaluminate;
- (b) a rare earth activated fine grained zinc sulfide;
- (d) a rare earth or transition metal activated zinc selenide; and
- (e) a rare earth or transition metal activated zinc sulfo-selenide,

wherein said phosphor film of (a), (b), (d) and (e) is provided with an aluminum nitride barrier layer on a top and/or bottom side of the phosphor film, said aluminum nitride barrier layer improving the stability of the interface between the phosphor film and the display.

Art Unit: 1774

The prior art does not provide for a method for making a stabilized phosphor laminate for use in a thick film dielectric electroluminescent device, said method comprising:

i) deposition of a phosphor selected from the group consisting of

a) a rare earth activated barium thioaluminate;

(b) a rare earth activated fine grained zinc sulfide;

(d) a rare earth or transition metal activated zinc selenide; and

(e) a rare earth or transition metal activated zinc sulfo-selenide,

onto a glass or glass ceramic substrate incorporating a first set of address lines and a dielectric layer;

ii) deposition of a layer of aluminum nitride on top of said phosphor film of (a)-(b) and

(d)-(e); and

iii) annealing said phosphor film at a temperature of up to about 1100°C.


### ***Response to Arguments***

7. Applicant's arguments with respect to the present claims have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Camie S. Thompson whose telephone number is (571) 272-1530. The examiner can normally be reached on Monday through Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena L Dye, can be reached at (571) 272-3186. The fax phone number for the Group is 571-273-8300.

Art Unit: 1774

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
RENA DYE  
SUPERVISORY PATENT EXAMINER  
AU 1774